Pre-Calculus CP 1 - Limits "As x approaches a number" **Name:** (KEY)

Determining Limits Algebraically:

- Step #1: Substitute the number that x is approaching INTO the equation!
- If substitution yields....
  - A number, then you are done! ☺
  - A number divided by zero will yield a vertical asymptote (we discussed those yesterday)
  - ZERO divided by ZERO then we will use known limits, graphs, or factoring/rationalizing in order to determine the limit.

Lots of Examples: The first four are the easiest type....

$\lim_{x\to 2} 3 =$ **3**

$\lim_{x\to -4} x =$ **−4**

$\lim_{x\to 2}(4x^2+3) = 4(2)^2+3 =$ **19**

$\lim_{x\to \pi}(\sin x) = \sin\pi =$ **0**

$\lim_{x\to 1}\left(\frac{x^2-1}{x-1}\right) = \lim_{x\to 1}\frac{(x+1)(x-1)}{x-1} = \lim_{x\to 1} x+1 =$ **2**

$\lim_{x\to -3}\frac{x^2+x-6}{x+3} = \lim_{x\to -3}\frac{(x+3)(x-2)}{x+3} = \lim_{x\to -3} x-2$

$= -3-2 =$ **−5**

Pre-Calculus CP 1 - Limits "As x approaches a number" **Name:** _____

$\lim_{x\to 2}\frac{2-x}{x^2-4} = \lim_{x\to 2}\frac{2-x}{(x+2)(x-2)} = \lim_{x\to 2}\frac{-1}{x+2} = \boxed{\frac{-1}{4}}$

$\lim_{x\to 5}\frac{x^2+5x}{x+5} = \lim_{x\to 5}\frac{(x+5)x}{x+5} = \boxed{5}$